SPECTRUM Enterprise Manager

Device Management

SmartSwitch 2000 Series

CABLETRON SYSTEMS

The Complete Networking Solution™

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Contents

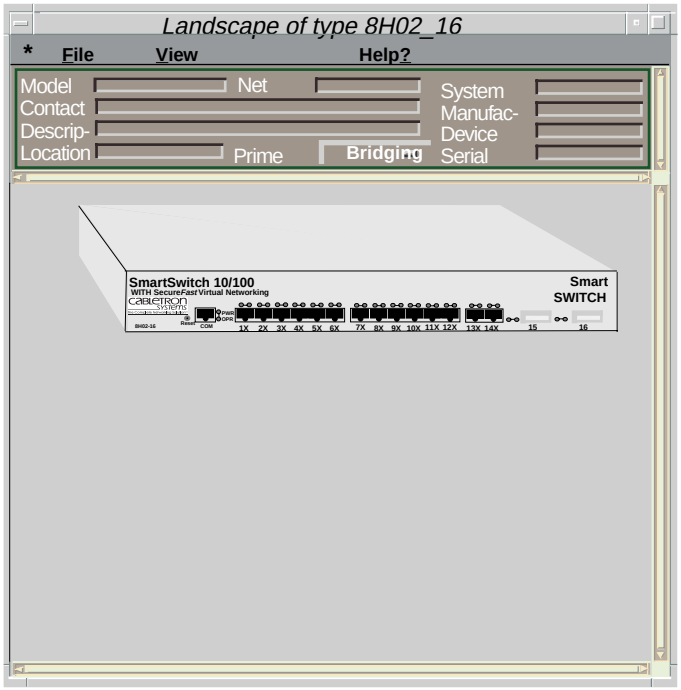
SmartSwitch Modules 4
8H02-16 5
2E42-27 & 2E42-27R 5
2E43-27 & 2E43-27R 5
2E48-27 & 2E48-27R 5
2E49-27 & 2E49-27R 5
SPECTRUM Model Type 6
Device Icon Views Summary 7
Application View 7
Configuration Views 8
Device Views 9
Chassis Device View 9
Interface Device View 10
Device Topology View 11
Model Information View 11
Performance View 12
SPECTRUM View Access 13
Management Tasks 14
Icons 15
Chassis Device Icon 15
Device Icon Subviews Menu Selections 17
Application Label Icon Subviews Menu Selections 17
Logical Ports Icon Subviews Menu 18
FDDI Label Icon Subviews Menu 18
Interface Icon 18
Interface Icon Subviews Menu Selections 20
Application Icon 21
Icon Subviews 22
Device Configuration View 23
Interface Configuration Table 24
Port Configuration - CSIIf Port 25
FddiMAC Device Configuration View 26
Station Configuration 26
SMT Information 27
FDDI Port Configuration View 30
Port Management 30
FDDI Stats View 32
Interface Remap Table View 33

SmartSwitch 2000 Series

This manual describes the physical device, the SPECTRUM model type, and the SPECTRUM views that are used to manage and monitor the SmartSwitch 2000 Series.

The SmartSwitch 2000 Series are standalone Fast Ethernet SmartSwitch Modules that provide fast Ethernet uplinks along with RMON port redirection, broadcast suppression, and full duplex support on all interfaces, with support for IEEE Auto-Negotiation on the 100Base-TX ports.

Figure 1. Physical Device View.



SmartSwitch Modules

The following modules make up the Smartswitch 2000 series as seen in Figure 1.

8H02-16

The 8H02-16 is a 16-port device having 14 standard 10Base-T front panel ports that are supported by RJ-45 connectors and two 100Base-TX or multi-mode fiber 100Base-FX uplinks using Fast Ethernet Port Interface Modules (FEPIMs).

2E42-27 & 2E42-27R

The 2E42-27 and 2E42-27R devices expand the capabilities of the 8H02-16 by providing 27 ports including 24 standard Ethernet ports with RJ-45 connectors, two slots for FEPIMs, and one slot for a High Speed Interface Module (HSIM) to provide a high-speed ATM uplink or FDDI connectivity. The 2E42-27 has a single power supply and the 2E42-27R has dual redundant power supplies.

2E43-27 & 2E43-27R

The 2E43-27 and 2E43-27R provide the same feature set as the 2E42-27 and 2E42-27R but come equipped with two RJ21 connectors to support 24 ports of switched Ethernet rather than the 24 RJ45's. This allows the use of Telco cables in the wiring closets with patch panels to reduce the complexity of cable management.

2E48-27 & 2E48-27R

The 2E48-27 and 2E48-27R SmartSwitches have 24 switched 10BaseFl ports via MMF ST, two FEPIM slots, and one HSIM slot for uplinks. The 2E48-27R has redundant power supplies. The 2E48-27R-A621 is preconfigured with an HSIM-A6DP and two APIM-21s.

2E49-27 & 2E49-27R

The 2E49-27 and 2E49-27R SmartSwitches have 24 switched 10BaseFL ports via SMF ST, two FEPIM slots, and one HSIM slot for uplinks. The 2E49-27R has redundant power supplies.

.

Note: All FEPIMs, APIMs, and HSIMs must be purchased separately.

SPECTRUM Model Type

This sections desctribes the Model Type used by SPECTRUM to manage and monitor these devices.

The Model Type representing the SmartSwtich modules listed on the previous page in SPECTRUM is **SSH8**. Examples of the Device Icons are shown in Figure 2.

Figure 2. Device Icons

Device Icon Views Summary

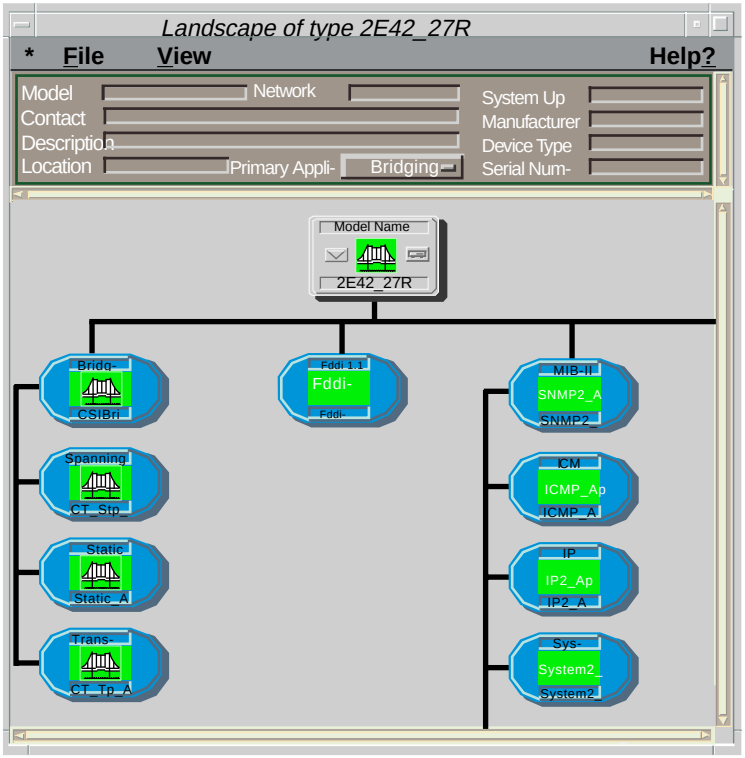
The following views are accessible from this Device Icon's double-click zones and Icon Subviews menu:

Application View

This view (Figure 3) displays icons that represent the applications supported by this device. These applications can vary depending on the device's configuration. The view you will see contains the applications supported by the device which you are modeling in SPECTRUM. Some of the applications (example: MIB-II) are common to all or most devices and are described in their own Application view reference documentation. An example of the icons as well as a listing of the device-specific applications can be found in the icon section. The device-specific applications are described under the Icon Subviews section.

Note: These views will vary depending on device type and front panel interfaces.

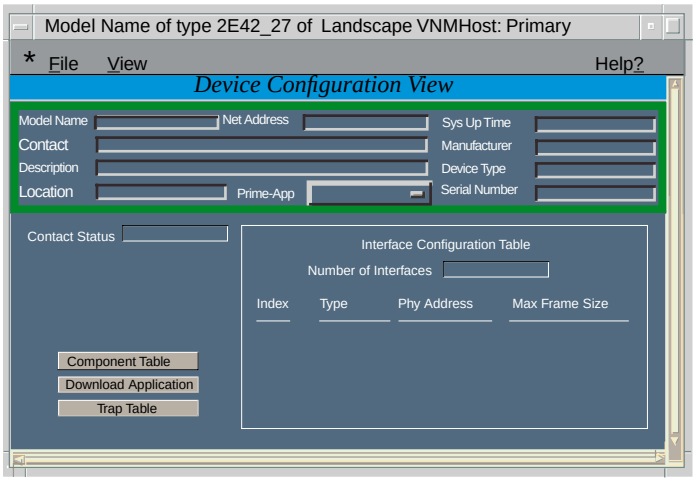
Figure 3. Example Application View



Configuration Views

These views (example Figure 4) display configuration and operating information specific to this device. The example on the opposite page shows a Device Configuration view, and any ports, interfaces or applications it may contain. Configuration views are described in the Icon Subviews section.

Figure 4. Example Configuration View



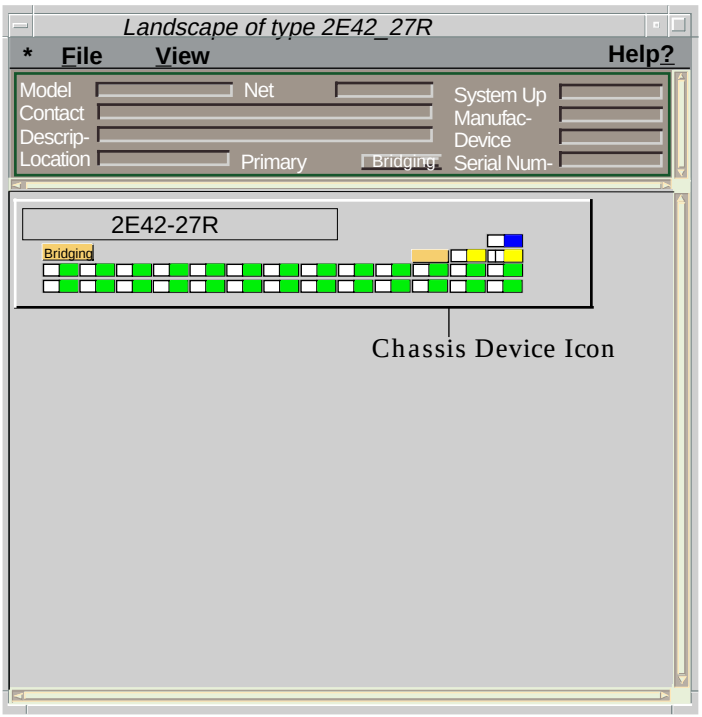
Device Views

These views display icons and labels that represent the device, its ports or interfaces, and applications. They are described under ***SPECTRUM Views*** within the Device Management documentation. This device supports two types of Device views described below: the Chassis Device view and the Interface Device view.

Chassis Device View

This view (Figure 5) displays the Module Icon that represents the 2E42-27R, its ports and interfaces. This view is described in the Icon Subviews section.

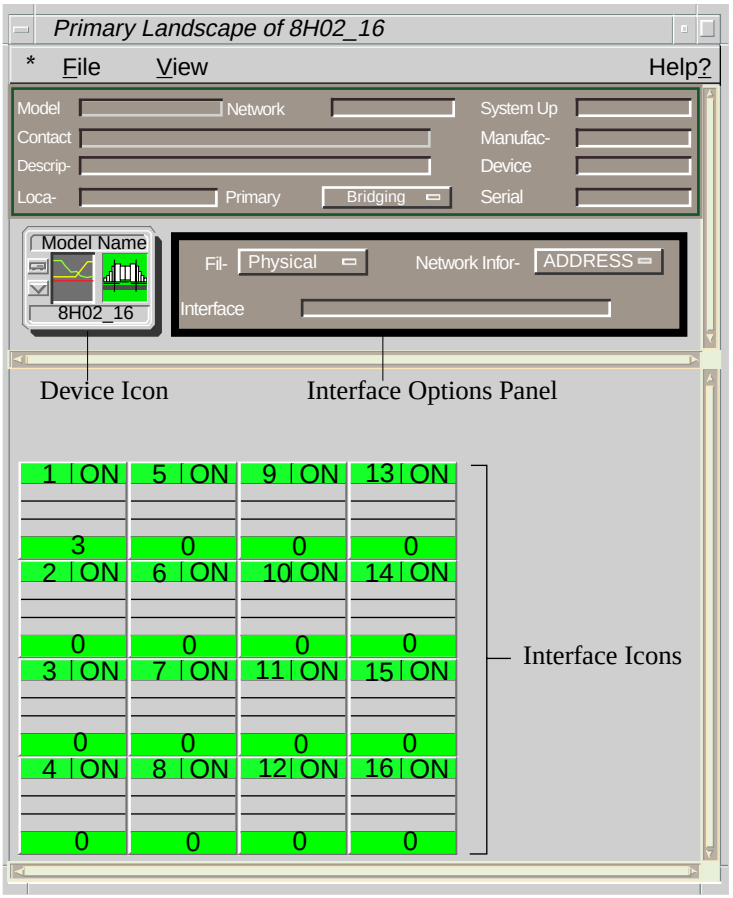
Figure 5. Example Chassis Device View



Interface Device View

This view displays the port icons (Figure 6) that represent the interfaces of an 8H02_16 SmartSwitch module. These icons are described under Icons (page 15).

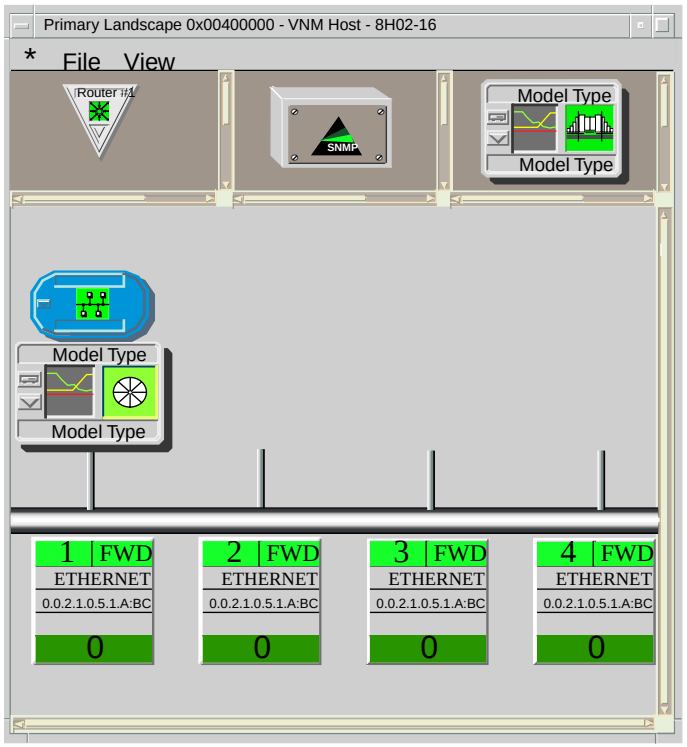
Figure 6. Example Interface Device View



Device Topology View

This view (Figure 7) displays icons that represent the device, its ports or interfaces, and the devices and LAN networks that contain those devices connected to its ports. It is described under ***SPECTRUM Views*** within the Device Management documentation.

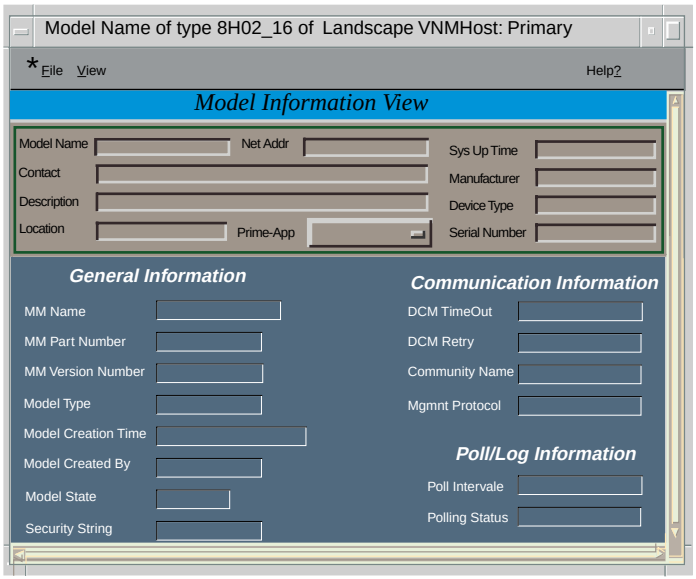
Figure 7. Example Device Topology View



Model Information View

This view (Figure 8) displays information about this device and allows you to set thresholds and alarm severity for this device. The Model Information view may vary depending on the model it defines. For a general description of a Model Information view refer to ***SPECTRUM Views*** within the Device Management documentation.

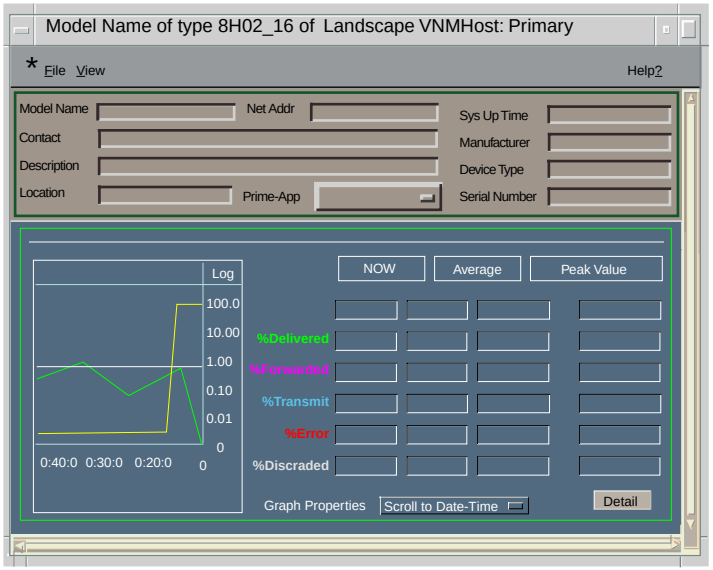
Figure 8. Example Model Information View



Performance View

This view (Figure 9) displays statistical information about the device, its ports or interfaces, and applications. The Performance view will display different statitistical information depending on the Device type, technology, or interface type. It is described under ***SPECTRUM Views*** within the Device Management documentation.

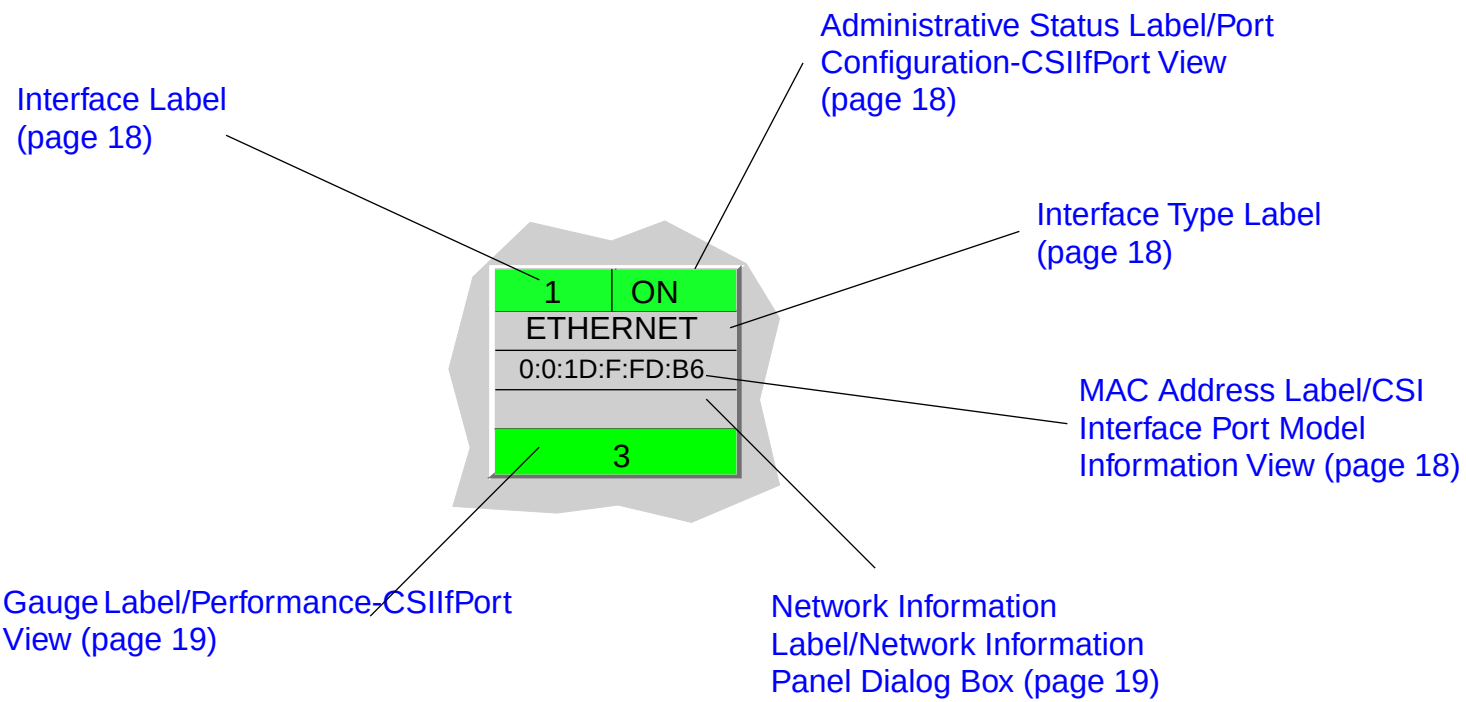
Figure 9. Example Performance View



SPECTRUM View Access

The views listed throughout this book are accessed through double-click zones on icons and from Icon Subviews menus for the particular icon displayed. For any given Icon, you will have a Subviews menu and any number of double-click zones, as shown in Figure 10, which is an example of the the device Icon located within the device view.

Figure 10. Device Icon


Administrative Status Label/Port Configuration-CSIIfPort View (page 18)
Interface Label (page 18)
Interface Type Label (page 18)
1
ON
ETHERNET
0:0:1D:F:FD:B6
3
MAC Address Label/CSI Interface Port Model Information View (page 18)
Gauge Label/Performance-CSIIfPort View (page 19)
Network Information Label/Network Information Panel Dialog Box (page 19)

Management Tasks

Monitor and Configure Interface or Port Operation

- Interface Configuration Table (page 24)
- Station Configuration (page 26)
- SMT Information (page 27)
- Port Management (page 30)
- Device Configuration View (page 23)
- Port Configuration - CSIIf Port (page 25)
- FddiMAC Device Configuration View (page 26)
- FDDI Stats View (page 32)

Enable (ON) Disable (OFF) a Port

- Administrative Status Label/Port Configuration-CSIIfPort View (page 18)
- Admin Status (page 25)
- Port Action (page 30)

Icons

This section describes the icons used to represent the modules, ports, and applications for the SmartSwitch 2000 Series devices in SPECTRUM.

Chassis Device Icon

This icon is a logical representation of the physical device and its front panel interfaces or ports (Figure 11). It provides the following labels that identify the ports/interfaces and their respective double-click zones:

Device Type Label
The type of device being modeled. Also, double-click access is provided to the Device Configuration View.

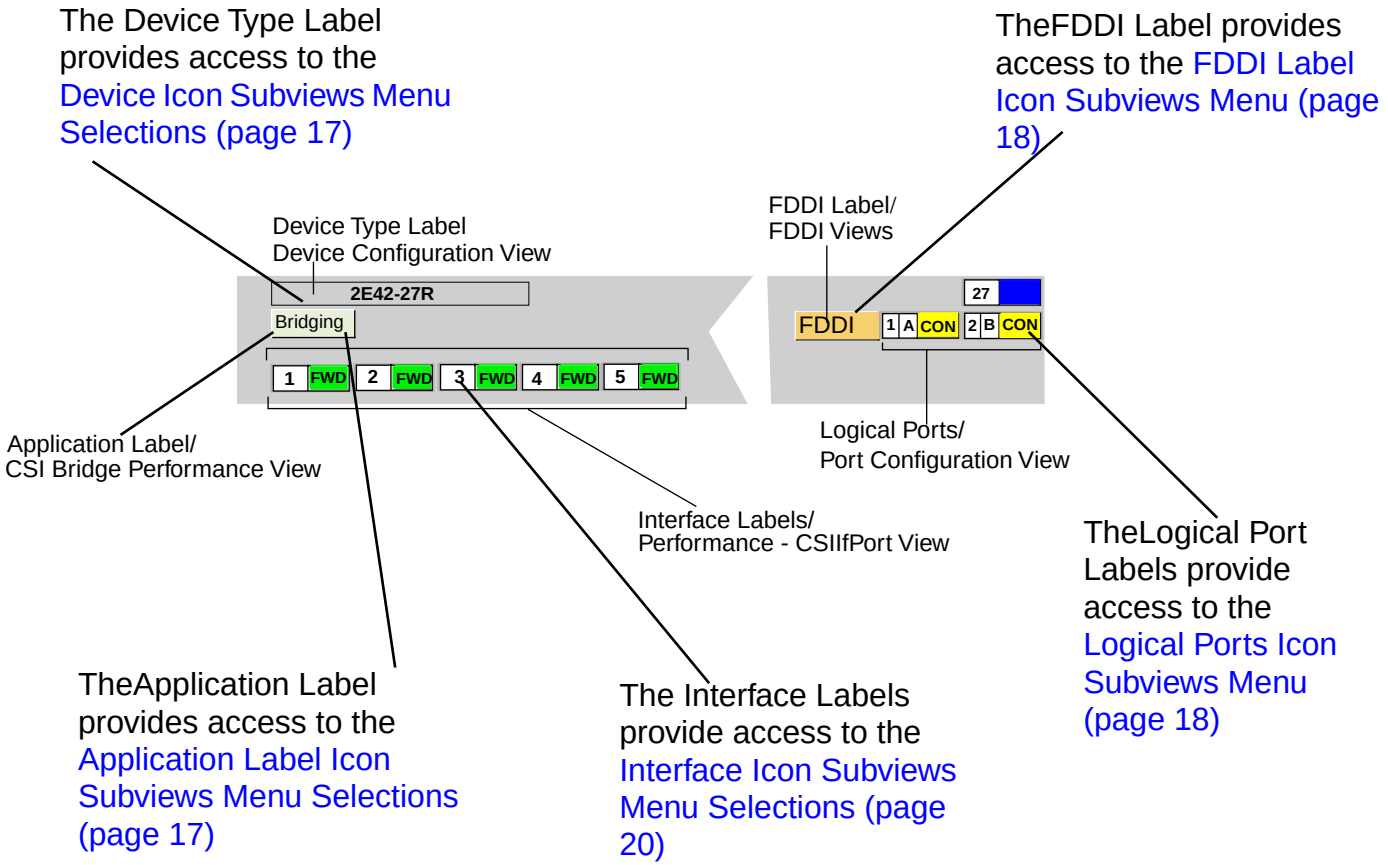
Application Labels
The type of application. Also, provides double-clcik access to the CSI Bridge Performance View.

Interface Labels
These labels identify the number and activity status of each port. and list the possible states relative to the application selected. Also, double-click access is provided to the Performance - CSIIfPort view

Logical Ports
These labels provide access to the Logical Port Icon Subviews menu as well as double click access to the Port Configuration View.

FDDI Label
This label provides access to the FDDI Icon Subviews menu as well as double click access to the FDDI Applications view.

Figure 11. 2E42-27R Chassis Device Icon


The Device Type Label provides access to the Device Icon Subviews Menu Selections (page 17)
TheFDDI Label provides access to the FDDI Label Icon Subviews Menu (page 18)
Device Type Label
Device Configuration View
FDDI Label/
FDDI Views
2E42-27R
Bridging
1 FWD 2 FWD 3 FWD 4 FWD 5 FWD
27
FDDI 1 A CON 2 B CON
Application Label/
CSI Bridge Performance View
Logical Ports/
Port Configuration View
Interface Labels/
Performance - CSIIfPort View
TheLogical Port Labels provide access to the Logical Ports Icon Subviews Menu (page 18)
TheApplication Label provides access to the Application Label Icon Subviews Menu Selections (page 17)
The Interface Labels provide access to the Interface Icon Subviews Menu Selections (page 20)

Device Icon Subviews Menu Selections

Table 1 lists each of the Icon Subviews menu selections specific to the Chassis Device Icon.

Table 1: Device Icon Subviews Menu Selections

Menu Selection	Description
Configuration	Opens the Device Configuration View (page 23)
Application Display	This menu selection allows you to selectwhich application will be displayed, physical or bridging.
Model Information	Opens the Model Information view described in ***SPECTRUM Views***.
Application View	Opens the Application view described in ***SPECTRUM Views***.
Module Notes	Opens the Module Notes dialog box described in ***SPECTRUM Views***.

Application Label Icon Sub-views Menu Selections

Table 2 lists specific Icon Subviews menu selections for the Application Label.

Table 2: Application Icon Subviews Menu Selections

Menu Selection	Description
Bridge Performance	Opens the Performance view described in ***SPECTRUM Views.***
Bridge Detail	Opens the Detail view described in ***Bridging Applications.***
Bridge Model Information	Opens the Model Information view described in ***SPECTRUM Views.***
Special Database	Opens the Special Database view described in ***Bridging Applications***
Spanning Tree Information	Opens the Spanning Tree Information view described in ***Bridging Applications.***
Static Database Table	Opens the Static Database Table view described in ***Bridging Applications***.
Transparent Bridge Info	Opens the Transparent Bridge Information view, with Forwarding Database and Port Tables described in***Bridging Applications***

Logical Ports Icon Subviews Menu

This menu allows you to either enable or disable the selected port.

FDDI Label Icon Subviews Menu

Table 3 describes each of the Icon Subviews menu selections available for FDDI.

Table 3: FDDI Label Icon SUbview Menu Selections

Menu Selection	Description
FDDI Performance	Opens the FDDI Performance view. (Not available for FddiNoMAC).
FDDI Configuration	Opens theFddiMAC Device Configuration View (page 26)
FDDI Station List	Opens the FDDI Station List view described in ***Miscellaneous Applications.***
FDDI Model Information	Opens the Model Information view for FDDI.

Interface Icon

This section describes the network interface module icon. Figure 12 provides an example of the network interface module icon and displays its labels/double-click zones.

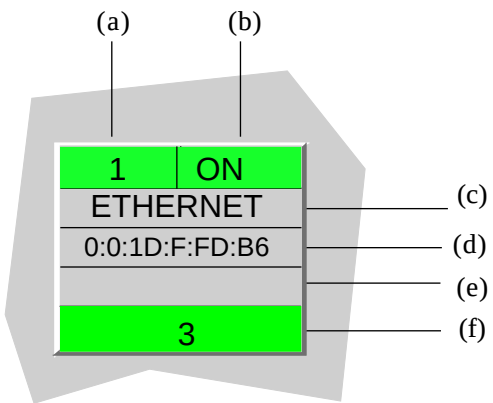
Interface Label
This label displays the number identifying this interface.

Administrative Status Label/Port Configuration-CSIIfPort View
This label displays the administrative state of this port (On, Off, Testing). It also provides double-click access to the Port Configuration - CSIIf Port (page 25).

Interface Type Label
This label displays the type of network interface module. For a complete lisiting of Interface types refer to ***SPECTRUM Views***.

MAC Address Label/CSI Interface Port Model Information View
This label displays the physical address of the network interface module. It also provides double-click access to the Model Information View described in ***SPECTRUM Views***.

Figure 12. Interface Icon



a. Interface Label
b. Administrative Status Label
c. Interface Type Label
d. MAC Address Label
e. Network Information Label
f. Gauge Label

Network Information Label/Network Information Panel Dialog Box

The Network Information label displays a user-selectable network information field. You can select the field to display (Network Address, Name, or Subnet Mask) using the interface options panel. The default field is the Network Address. Double-click this label to access the Network Information Panel Dialog Box described in ***SPECTRUM Views***.

Gauge Label/Performance-CSIIfPort View

The Gauge label displays the color of the statistic selected for the Interface icon from the Gauge Control Panel accessible from the Interface Options Panel described with the Interface Device view, and provides double-click access to the Performance View described in ***SPECTRUM Views***.

Interface Icon Subviews Menu Selections

Table 4 describes each of the Icon Subviews menu selections available for the interface icon.

Table 4: Interface Icon Subviews Menu Selections

Menu Selection	Description
Configuration	Opens the Port Configuration - CSIIf Port (page 25).
Secondary Address Panel	Opens the Seconday Address Panel Described in ***SPECTRUM Views***.
Model Information	Opens the Model Information view described in ***SPECTRUM Views***.

Application Icon

This icon (Figure 13) represents one of the device specific applications supported by this device. Table 5 is a list of the device specific applications and Table 6 is a list of the common applications supported by this device.

Figure 13. Example Application Icon

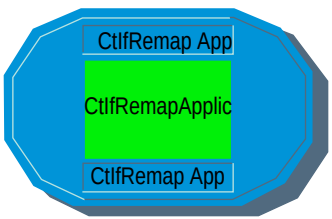


Table 5: Device Specific Applications

Application	Menu Selections/Views
CtIf Remap Application (CtIfRemapApp)	Opens the IInterface Remap Table View (page 33).
FDDI FNB Application (FddiMac).	Opens the FddiMAC Device Configuration View (page 26).

Table 6: Common Applications Supported

Application	Reference
Bridging (CSIBridge)	***Bridging Application View Reference***.
MIB-II (SNMP2_Agent)	***MIB-II Application View Reference.***
DownLoad (CtDownLoad App)	***Other Application View Reference.***
RFC1317 (RFC1317App)	***Other Application View Reference.***
ATM (ATMClientApp)	***Other Application View Reference.***
Fast Ethernet (FastEnetApp)	***Other Application View Reference.***

Icon Subviews

This section provides general descriptions of the Configuration and application-specific views that display MIB information for the SmartSwitch 2000 Series.

The Configuration views allow you to access network configuration information for the device and its ports. The 2000 Series SmartSwitches support the following Configuration views:

- Device Configuration View (page 23)
- Port Configuration - CSIIf Port (page 25)
- FddiMAC Device Configuration View (page 26)
- FDDI Port Configuration View (page 30)
- FDDI Stats View (page 32)

The Application views provides access to application specific information. The following views for device-specific applications are described in this section:

- Interface Remap Table View (page 33) (IfRemapAplication)

Device Configuration View

This view provides the following information about operating status and Device configuration:

Contact Status
This field indicates if a connection with the device has been established.

Component Table

This button provides access to the Community Names view. This is an SPMA view. For information on using the Community Name view, refer to the ***SPECTRUM Portable Management Application Tools Guide.***

Download Application

This button provides access to the Download Application view which allows you to upgrade the firmware for the device from a TFTP Boot or Bootp Server. For more information on this view refer to ***SPECTRUM Portable Management Application Tools Guide***.

Trap Table

This button Opens the Trap Table, which allows you to set up your workstation to be notified of traps received and sent by the Fast Ethernet SmartSwitch Module.

Continued...

Interface Configuration Table

Number of Interfaces
Displays the number of interfaces available from this device.

Index
The numerical value identifying the port.

Type
The type of hardware interface for the port.

Phy Address
The (MAC) address of the port.

Max Frame Size
The maximum frame size for the SmartSwitch network interface modules.

Oper Status
The current operational state of this port Up,Down, or Testing).

Port Configuration - CSIIf Port

This view displays port-specific MIB information for this device. Access this view from the Icon Subviews menu for the Interface icon.

Interface Index
The numerical value identifying the port.

Interface Type
The type of interface for the port (FDDI).

Operation Status
The current operating state of the port. Possible values are On, Off, or Test.

Admin Status
This field provides a button that allows you to change the current administrative state of the port. Possible values are On, Off, or Test.

IF Description
Displays a description of the interface.

FddiMAC Device Configuration View

This view provides information on the configuration and operating status of the concentrator. Access this view using one of the following methods:

- Highlight the FddiMAC Icon and from the Icon Subviews menu select **Configuration.**
- Highlight the FDDI Ring label in the Chassis Device view and from the Icon Subviews menu select **FDDI Configuration.**

Station Configuration

This area of the FddiMAC Device Configuration view provides information specific to the FDDI station:

Ring State
The current state of the FDDI Ring. Table 7 lists the possible states and their descriptions.

MAC Configuration
Displays the actual configuration of the station. Table 8 lists the possible configurations and their descriptions.

Current MAC Path
The ring that this station resides on. Possible entries are Primary, Secondary, Local or Isolated.

MAC Address
The MAC (physical) address of this station.

MAC Count
The number of MACs supported by this station.

Non Master Ports
The number of non-master ports on this station.

Master Ports
The number of master ports on this station.

Continued...

SMT Information

This section of the FddiMAC Device Configuration view provides the following configuration information on the FDDI SMT:

SMT Version
The version of Station Management (SMT) running.

OBS Present
Indicates whether an Optical Bypass Switch (OBS) is connected.

T-Notify (sec)
The timer value, in seconds, used in Neighbor Notification Protocol. The allowed range is from 2 to 30 seconds.

T-Req (milli sec)
The Target Token Rotation Time (TTRT) bid, in milliseconds, made by this concentrator.

T-Neg (milli sec)
The winning TTRT bid, in milliseconds, on the ring.

TVX (milli sec)
The valid transmission time, in milliseconds.

Table 7: FDDI Ring States

Ring States	Description
Isolated	The concentrator is not attached to the ring.
Non-Op	The concentrator is attempting to enter the ring.
Ring-Op	The ring is operational.
Detect	The claim/beacon process of the FDDI ring protocol has exceeded 1 second. This indicates a potential problem.
Non-Op-Dup	The ring failed to complete the claim/beacon process because a duplicate FDDI address has been detected.
Ring-Op-Dup	The ring is operational, but a duplicate FDDI address has been detected.
Directed	The claim/beacon process did not complete within 9 seconds. The concentrator is now sending directed beacons to indicate a problem.
Trace	A problem has been detected with the station or its upstream neighbor. A trace is being sent to notify the upstream neighbor of the problem. The concentrator and all stations between the concentrator and its upstream neighbor can perform self-tests.

Table 8: SMT MAC Configurations

Ring States	Description
Isolated	The path is not inserted into any path.
Local_A	The A port is inserted into a local path and the B port is not.
Local_B	The B port is inserted into a local path and the A port is not.
Local_AB	Both A and B are inserted into a local path.
Local_S	The S port is inserted into a local path.
Wrap_A	The secondary path is wrapped to the A port.
Wrap_B	The secondary path is wrapped to the B port.
Wrap_AB	The primary path is wrapped to the B port and the secondary path is wrapped to the A port.
Wrap_S	The primary port is wrapped to the S port.
C_Wrap_A	The primary and secondary paths are joined internally in the station and wrapped to the A port. Regarding token flow, all resources on the secondary path precede those of the primary path.
C_Wrap_B	The primary and secondary paths are joined internally in the station and wrapped to the B port. Regarding token flow, all resources on the secondary path precede those of the primary path.
C_Wrap_S	The primary and secondary paths are joined internally in the station and wrapped to the S port. Regarding token flow, all resources on the secondary path precede those of the primary path.
Thru	The primary path enters the A port and emerges from the B port. The secondary path enters the B port and emerges from the A port.

FDDI Port Configuration View

*This view provides information on the configuration and operating status of the ports. To access this view, click on the FDDI Port icon in the Chassis Device view to highlight it and select **Port Configuration View** from the Icon Subviews menu.*

Port Management

This section of the FDDI Port Configuration view provides the following information:

Port Action
This field provides a button that allows you to enable/disable the port. The state returns to "Other" once the port has been Enabled/Disabled.

Port State
The status of this port. Possible states are disabled, connecting, standby, and active.

Port Type
The type of port. Possible port types are A_Port, B_Port, Slave, or Master.

Link Error Rate Estimate
The link error rate estimate is a cumulative long-term average of the bit error rate, which represents the quality of the physical link. The link error rate estimate is computed when the port is connected and every 10 seconds thereafter. It ranges from 10^{-4} to 10^{-15} and is reported as a whole integer. For example, if the port's link error rate estimate is computed to be 10^{-5}, the value reported in this field would be 5, which represents an actual rate of 1,250 bit errors per second. A lower link error rate estimate indicates a higher bit error rate as shown in Figure 14.

Link Error Monitor Count
The aggregate link error monitor count. This count is set to zero on station power up and increments each time the port's link error monitor detects an error. An increasing link error monitor count usually indicates a problem with the connectors or the cable between this port and the node.

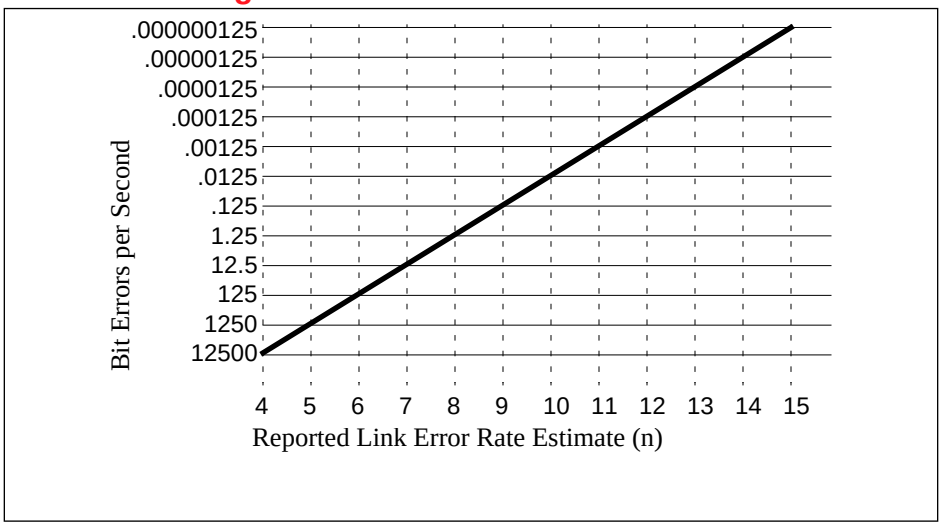
Continued...

Link Error Rate Cutoff
The link error rate threshold at which a link connection is flagged as faulty and the port disabled by SMT. The default link error rate cutoff threshold is 7, which represents 12.5 bit errors per second.

Link Error Rate Alarm
The link error rate threshold that, if exceeded, generates an alarm for the port. The default link error rate alarm threshold is 8, which represents 1.25 bit errors per second.

Link Error Monitor Reject Count
The link error monitor count of the times the link has been rejected.

Figure 14. Link Error Rate Estimate



FDDI Stats View

The FDDI Stats view displays the bandwidth statistics of the FDDI ring and basic information about the devices on the ring and FDDI network. To access the FDDI Stats view, hghlight the Fddi MAC application icon (Icon Mode), or text label (List Mode) and select **View->Bandwidth Util**.

Fddi Frames (Frm/Sec)
Provides the number of FDDI frames per second for the device.

Fddi KBytes (Kb/Sec)
Provides the number of FDDI KBytes per second for the device.

Fddi Peak KBytes (Kb/Sec)
Provides the number of FDDI peak KBytes per second for the device.

Time of Peak
Provides the time of peak in **Day:Month:Time:Year** format for the device.

Bandwidth Utilization %
Provides the amount (in percent) of bandwidth utilized by the device. The chart provides a graphical representation of the bandwidth being utilized in bytes/second on the FDDI ring.

Interface Remap Table View

The application provides the ability to map one or more interfaces to another interface. A map is defined by creating a row in the Interface Remap Table (described below) to specify the source and destination interfaces. When a source interface is remapped to a destination interface, the destination interface transmits all packets received or transmitted on the source interface. Counters on the destination interface increment for all packets transmitted by normal bridging or due to the interface remap. To access this view, highlight the CtIfRemapApp icon (Icon mode) or text label (List mode) and select ***Icon Subviews -> Port Remap*** *from the View menu.*

Number Entries
The number of active entries in the Interface Remap Table.

Physical Errors Enable
Physical error remapping can be Enabled, Disabled, or Unsupported. Unsupported indicates that the device is incapable of remapping physical errors.

Max Number Entries
The maximum number of entries allowed in the Interface Remap Table.

Sort

Used to sort the Interface Remap Table.

Find

FInds a specific interface within the Remap Table..

Port Redirect

This button opens the Port Redirect view, where you can add or delete any entry from this table.

Update

Used to update the Interface Remap Table.

Source Port
The source interface that will have packets redirected to the destination interface as defined by **Destination**.

Destination
The interface that will see all packets redirected from **Source Port**.

Index

Numerics

2E42-27 & 2E42-27R 5
2E43-27 & 2E43-27R 5
2E48-27 & 2E48-27R 5
2E49-27 & 2E49-27R 5
8H02-16 5

A

A_Port 30
Address
  Ethernet 24
  MAC 18, 19, 24
  Mac 26
  Physical 24
Administrative Status Label 18
Alarm
  Link Error Rate 31
Application
  FDDI FNB 22
Application Icon 21
Application Label
  Icon Subviews Menu
    Selections 17
Application View 7

B

B_Port 30
Beacon 28

C

C_Wrap
  A 29
  B 29
  S 29
Chassis Device Icon 15
  Application Labels 15
  Device Type Label 15
  FDDI Label 15
  Interface Labels 15
  Logical Ports 15
Claim/Beacon Process 28
Component Table 23
Concentrator
  Isolated 28
Configuration View 20
  Device 23
  FddiMAC Device 26
Contact
  Status 23
CSIIfPort
  Configuration 25

D

Detect 28
Device Configuration View 23
  FddiMAC 26
Device Icon Views Summary 7
Device Views 9
  Chassis Device View 9
  Device Topology View 11
  Interface Device View 10
  Model Information View 11
  Performance View 12
Directed 28
DownLoad Application 23

E

Error 31
Monitor Count
Link 30
Monitor Reject Count
Link 31
Rate Alarm
Link 31
Rate Cutoff
Link 31
Rate Estimate
Link 30

F

FDDI
Configuration 18
MAC
Device Configuration View 26
Model Information 18
Performance 18
Station List 18
Fddi Stats View
Bandwidth Utilization % 32
Fddi Frames (Frm/Sec) 32
Fddi KBytes (Kb/Sec) 32
Fddi Peak KBytes (Kb/Sec) 32
Time of Peak 32
FddiMAC
Device Configuration View
Current MAC Path 26
MAC Address 26
MAC Configuration 26
MAC Count 26
Master Ports 26
Non Master Ports 26
Ring State 26
FddiMAC Device Configuration View 26
Firmware
Revision 23
FNB
Configuration View 25
Frame Size
Maximum 24

G

Gauge
Logical 19
Gauge Label 19

I

Interface
Icon Subviews Menu Selections 20
Number 18, 19
Interface Configuration Table
Index 24
Maximum Frame Size 24
Number of Interfaces 24
Oper Status 24
Physical Address 24
Type 24
Interface Icon 18
Interface Number Label 18
Interface Remap Table
Destination 33
Max Number Entries 33
Number Entries 33
Physical Errors Enable 33
Source Port 33
Isolated 29

L

Link
Error
Monitor
Count 30
Reject Count 31
Rate
Alarm 31

Cutoff 31
Estimate 30
Local
A 29
AB 29
B 29
S 29
Logical Port
Icon Subviews Menu Selections 20
Logical Ports Icon Subviews Menu 18

M

MAC
Address 18
Label 19
MAC Address 18
Management Tasks 14
Enable (ON) Disable (OFF) a Port 14
Monitor and Configure Interface or Port Operation 14
Mapping Interfaces 33
Master 30
Model Information View 20
Monitor
Reject Count
Link Error 31
Monitor Count
Link Error 30

N

Neighbor
Notification Protocol 27
Upstream 28
Network
Information 19
Non-Op 28
Dup 28

O

OBS
Present 27
Optical Bypass Switch 27

P

Path
Current MAC 26
Port
Action 30
Configuration
View 25
Management 30
State 30
Type 30
Port Configuration
Admin Status 25
Interface Index 25
Interface Type 25
Operation Status 25
Port Configuration - CSIIf Port 25
Port Configuration View 30
Port Status 15
Port Type Label 19
Ports
Master 26
Non Master 26
Protocol
Neighbor Notification 27

R

Restricted Rights Notice 2
Ring
Operational 28
Ring States
FDDI 28
Ring-Op
Dup 28

S

Slave 30
SmartSwitch 2000 Series 4
SMT
  Information 27
  Version 27
Spectrum Model Types 6
SPECTRUM View Access 13
Station
  Configuration View 26
  Management 27
Status
  Administrative 19
  Adminstrative 18

T

Target Token Rotation Time 27
Thru 29
Time
  Target Token Rotation 27
  Valid Transmission 27
T-Neg 27
T-Notify 27
Token
  Rotation Time
    Target 27
Trace 28
Trademarks 2
T-Req 27
TTRT 27
TVX 27

U

Upstream Neighbor 28

V

Valid Transmission Time 27

W

Wrap
  A 29
  AB 29
  B 29
  S 29